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Seiji Aiso

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EXAMINER

DIVERSE, PIERRE P

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

09/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/541,479	Applicant(s) AISO, SEIJI	
	Examiner PIERRE DIVERSE	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/18/2008, 07/18/2008, 08/25/2006, 08/24/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 – 24 are pending in this application.
2. Claims 4 - 6, 8 - 10, 15 – 21, 23 and 24 have been amended.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The information disclosure statements (IDS) filed on 08/24/2006, 08/25/2006, 07/18/2008 and 07/18/2008 are in compliance with the provisions of 37 CFR 1.97, and have been considered and a copy is enclosed with this office action

Claim Objections

5. Claims 1, 11, 12, 22 - 24 objected to because of the following informalities:
Claims 1, 11, 12 and 22 - 24 recite the limitation "generating a still image from a plurality of frame images contained in a video image", a video image, as it is commonly understood, refers to a single frame (a single image), therefore it cannot contain a plurality of frames. Examiner has assumed that instead of "from a video image" what was meant was "from a video sequence". Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1 – 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 1 defines a “device”.

However, while the preamble defines a “device”, which would typically be indicative of an “apparatus”, the body of the claim lacks definite structure indicative of a physical apparatus. Furthermore, the specification on page 10 lines 5 - 8 indicates that the invention may be embodied as pure software. Therefore, the claim as a whole appears to be nothing more than a collection of software modules, thus defining functional descriptive material per se. Claims 2 – 10 fall accordingly because of their dependence on claim 1.

Functional descriptive material may be statutory if it resides on a “computer-readable medium or computer-readable memory”. The claim(s) indicated above lack structure, and do not define a computer readable medium and are thus non-statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable,

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and thus NOT able to impart any functionality of the recited program. The examiner suggests:

1. Amending the claim(s) to embody the program on “computer-readable medium” or equivalent; assuming the specification does NOT define the computer readable medium as a “signal”, “carrier wave”, or “transmission medium” which are deemed non-statutory; or

2. Adding structure to the body of the claim that would clearly define a statutory apparatus.

Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

“A transitory, propagating signal ... is not a “process, machine, manufacture, or composition of matter.” Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter.” (*In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007).

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a “signal”, the claim as a whole would be non-statutory. Should the applicant’s specification define or exemplify the computer readable medium or memory (or whatever language applicant chooses to recite a computer readable medium equivalent) as statutory tangible products such as a hard

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drive, ROM, RAM, etc, **as well as** a non-statutory entity such as a “signal”, “carrier wave”, or “transmission medium”, the examiner suggests amending the claim to include the disclosed tangible computer readable storage media, while at the same time excluding the intangible transitory media such as signals, carrier waves, etc.

8. Claim 23 and 24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 23 and 24 are drawn to functional descriptive material recorded on a computer readable medium. Normally, the claim would be statutory. However, the specification, at page 10 defines or exemplifies the claimed computer readable medium as encompassing statutory media such as a “ROM”, “hard drive”, “optical drive”, etc, as well as ***non-statutory*** subject matter such as a “data signal embodied in a carrier wave”.

“A transitory, propagating signal ... is not a “process, machine, manufacture, or composition of matter.” Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter.” (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007)).

Because the full scope of the claim as properly read in light of the disclosure appears to encompass non-statutory subject matter (i.e., because the specification defines/exemplifies a computer readable medium as a non-statutory signal, carrier waver, etc.) the claim as a whole is non-statutory. The examiner suggests amending the claim to include the disclosed tangible computer readable storage media, while at the same time excluding the intangible transitory media such as signals, carrier waves,

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etc. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 - 8, 11- 19 and 22 - 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Peleg et al., WO 98/02844 published on Jan. 22, 1998 (“Peleg”).

11. Regarding claim 1, Peleg discloses ‘An image generating device for generating a still image from a plurality of frame images contained in a video image’ (see page 3, line 32 – 36 ; page 5, lines 10 - 15). Peleg specifically suggests an apparatus for constructing an image mosaic (a still image from a plurality of images) and that the source of images can be a video camera (hence a video).

‘a synthesis object setting module for setting, from among areas included in frame images other than a reference frame image selected from among the plurality of frame images (see page 3 lines 28 – 36; Peleg specifically suggests a means for selecting source images and a means for selecting source image segments from the set of images), one or more areas as object frame image areas for synthesis (see page 3,

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lines 28 – 36; page 6 lines 7 – 10; Peleg specifically suggests cutting sub-images out of larger images to merged into the mosaic), the object frame image areas being selected according to a predetermined rule relating to a reference frame image area within the reference frame image' (see page 1, lines 31 – 33; page 6, lines 12 – 22; page 7 lines 14 – 25). Peleg specifically suggests that sub-regions of the images are selected or inclusion in the mosaic based on location or quality (predetermine rule);

'a comparison reference extracting module for extracting one comparison reference frame image area from among the reference frame image area and the object frame image areas for synthesis' (see page 7, lines 14 - 25). Peleg specifically suggests that the automatic selection finds appropriate cut lines between neighboring images;

'a target extracting module for extracting one target frame image area from among the object frame image areas for synthesis other than the comparison reference frame image area (see page 6, lines 7 - 10). Peleg specifically suggests that source selection includes cutting sub images (target frame area) out of larger images (object frame image);

'a comparing module for comparing the comparison reference frame image area with the target frame image area to calculate a pre-selected parameter' (see page 3, lines 28 – 36; page 6, lines 16 – 19; page 6 lines 36 – page 7 line 4). Peleg specifically suggests that the alignment process provides information on the degree of overlap and that images may be discarded if their overlap is too large or images added if the overlap

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is too little; the overlap corresponds to the pre-selected parameter and the alignment of the images teaches a comparison of those images;

‘an excluding module for excluding the target frame image area from the object frame image areas for synthesis if the parameter does not meet a predetermined criterion’ (see page 6, lines 36 – page 7, line 4; page 28, lines 9 – 17). Peleg specifically suggests that when alignment fails, the image that is being aligned is changed (excluded) and that alignment failure can be detected by variety of criteria (predetermined criterion); and

‘a synthesized image generating module for synthesizing the reference frame image area and the object frame image areas for synthesis to create a synthesized image area’ (see page 3, lines 28 – 36; page 6, lines 12 – 22; page 7, lines 33 - 35). Peleg specifically suggests the generation of a mosaic image (synthesized image area) from a set of images.

12. Regarding claim 2, Peleg discloses ‘a setting module for setting as the reference frame image area an area within the reference frame image, to serve as a reference for synthesis’ (see page 3, lines 28 – 36). Peleg specifically suggests constructing a mosaic image by selecting source images, aligning them to select source image segments (frame image area within the frame image) to merge (synthesize) them into a mosaic; and

‘a frame number controlling module for repeating processes of the synthesis object setting module, the comparison reference extracting module, the object

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extracting module, the comparing module, and the excluding module, until the total number of the reference frame image area and the object frame image areas for synthesis meeting the criterion reaches a predetermined number. (see page 9, lines 29 – 34; page 5 line 35 – 35; page 6, lines 1 - 4). Peleg specifically suggests that his method is iterative this teaches that all steps setting, comparison, extraction and exclusion are repeated. Peleg also teaches that start and stop frames are selected and that all intermediate frames should be used, which teaches that once the number of intermediate frames is used (the predetermined number) processing stops.

13. Regarding claim 3, Peleg discloses 'a specification receiving module for receiving specification of the reference frame image, wherein the setting module sets the specified frame image as the reference frame image' (see abstract; page 5 line 31 – 34). Peleg specifically suggests that a set of images is selected to be combined from a set of source images and that the selection process finds a set of good quality images that cover the intended domain and content (reference frame image).

14. Regarding claim 4, Peleg discloses 'the comparison reference extracting module sets the reference frame image area as the comparison reference frame image area' (see page 28, lines 19 – 26). Peleg specifically suggests that the most recently aligned image is designated the region of interest for correlation (comparison) between it and current image.

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15. Regarding claim 5, Peleg discloses 'an eliminating module for eliminating, from among the object frame image areas for synthesis, an area of frame image for which a characteristic of the frame image area meets a predetermined condition' (see page 6, line 37 – page 7 line 4). Peleg specifically suggests that images may be discarded (eliminated) if their overlap is too large (predetermined condition).

16. Regarding claim 6, Peleg discloses 'the parameter is an image shift amount' (see page 6, lines 16 – 19; page 6, line 37 – page 7 line 4). Peleg specifically suggests that the parameter may be shift, rotate, dilate, projective or general flow.

17. Regarding claim 7, Peleg discloses 'a frame shift calculating module for calculating the image shift amount of a target frame image containing the target frame image area, with respect to a comparison reference frame image containing the comparison reference frame image area (see page 6, lines 12 – 19). Peleg specifically suggests that the source images are aligned with one another so that each is in registration with the corresponding portions of neighboring images and that alignment entails finding a geometrical transformation (shift) that brings them into a common coordinate system; By finding this geometrical transformation the shift amount of the target frame with respect to the comparison frame image is found as well as the shift amount of the target frame image area with respect to the comparison image area; and

'an area shift calculating module for calculating the image shift amount of the target frame image area with respect to the comparison reference frame image area,

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based on the image shift amount calculated by the frame shift calculating module'(see page 6, lines 12 – 19). Peleg specifically suggests that the source images are aligned with one another so that each is in registration with the corresponding portions of neighboring images and that alignment entails finding a geometrical transformation (shift) that brings them into a common coordinate system; By finding this geometrical transformation the shift amount of the target frame with respect to the comparison frame image is found as well as the shift amount of the target frame image area with respect to the comparison image area.

18. Regarding claim 8, Peleg discloses 'wherein the parameter is an image difference derived from comparison of pixel characteristic values at identical locations in the target frame image area and the comparison reference frame image area' (see page 11, lines 21 – 25). Peleg specifically suggests the use of cross correlation and least square error as methods for aligning pairs of images and maximize a measure of match (difference derived from comparison) over the overlap regions (identical locations in the image areas).

19. Regarding claim 11, Peleg discloses ' An image generating device for generating a still image from a plurality of frame images contained in a video image' (see page 3, lines 28 – 36; Peleg specifically suggests an apparatus for constructing an image mosaic), 'wherein if an evaluation value based on a characteristic value of an image (see page 3, lines 28 – 36; page 6, lines 16 – 19; page 6 lines 36 – page 7 line 4; Peleg

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specifically suggests that the alignment process provides information on the degree of overlap and that images may be discarded if their overlap is too large or images added if the overlap is too little; the overlap corresponds to the characteristic value), the evaluation value being calculated by comparing a reference frame image area which is an area serving as a reference for synthesis and contained in a reference frame image which is one of the plurality of frame images, with a comparison target frame image area which is one of areas contained in the plurality of frame images (see page 28, lines 20 – 21; Peleg specifically suggests a doing correlation between an image and an region of interest), meets a predetermined criterion, the image generating device synthesizes the reference frame image area and the comparison target frame image area' (see page 3, lines 28 – 36; page 6, lines 16 – 19; page 6 lines 36 – page 7 line 4; page 7, lines 33 - 35) Peleg specifically suggests that the alignment process provides information on the degree of overlap and that images added. Peleg further suggests that after this step source images are combined into a single mosaic.

20. Method claim 12 is drawn to the method of using the corresponding apparatus claimed in claim 1. Therefore method claim 12 corresponds to apparatus claims 1 and is rejected for the same reasons of anticipation as used above.

21. As to claim 13, the discussions are addressed with respect to claim 2.

22. As to claim 14, the discussions are addressed with respect to claim 3.

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23. As to claim 15, the discussions are addressed with respect to claim 4.

24. As to claim 16, the discussions are addressed with respect to claim 5.

25. As to claim 17, the discussions are addressed with respect to claim 6.

26. As to claim 18, the discussions are addressed with respect to claim 7.

27. As to claim 19, the discussions are addressed with respect to claim 8.

28. Method claim 22 is drawn to the method of using the corresponding apparatus claimed in claim 11. Therefore method claim 22 corresponds to apparatus claims 11 and is rejected for the same reasons of anticipation as used above.

29. Regarding claim 23, Peleg discloses 'a computer program stored on a computer readable medium for generating a still image from a plurality of frame images contained in a video image" (see page 25, lines 27 – 36). Peleg specifically suggests that software running on a unmodified computer to perform a method to generate an image mosaic (a still image from a plurality of images)

The remaining limitations of claim 23 are similar in scope to those of claim 1 as such they are addressed in the discussions of claim 1.

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30. Regarding claim 24, Peleg discloses 'A computer program stored on a computer readable medium for generating a still image from a plurality of frame images contained in a video image' (see page 25, lines 27 – 36). Peleg specifically suggests that software running on a unmodified computer to perform a method to generate an image mosaic (a still image from a plurality of images).

The remaining limitations of claim 24 are similar in scope to those of claim 11 as such they are addressed in the discussions of claim 11.

Claim Rejections - 35 USC § 103

31. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

32. Claims 9 - 10 and 20 - 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peleg et al., WO 98/02844 published on Jan. 22, 1998 ("Peleg") as applied to claims 1 and 11 above, and further in view of Szeliski et al., U. S. Patent No. 5,987,164 published Nov. 16, 1999 ("Szeliski").

33. Regarding claim 9, Peleg discloses 'an image generating device according to claim 1' (see page 3, line 32 – 36 ; page 5, lines 10 - 15). Peleg specifically suggests

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an apparatus for constructing an image mosaic (a still image from a plurality of images) and that the source of images can be a video camera (hence a video). It is noted that Peleg does not specifically disclose 'the parameter is a correlation of average values of pixel characteristic values in the target frame image area and in the comparison reference frame image area'

However, within the same field of endeavor, Szeliski does disclose 'the parameter is a correlation of average values of pixel characteristic values in the target frame image area and in the comparison reference frame image area' (see column 26, lines 26 – 37). Szeliski specifically suggests that for each patch (target frame area and reference frame area) pair-wise motion estimates are combined in a normalized average (correlation of average values).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Szeliski in to those of Peleg, because both Szeliski and Peleg are within the same field of endeavor (see Peleg Abstract and Szeliski Abstract), both are directed to building image mosaics. Further, users of Peleg's invention would not only be able to generate mosaic images from video, but would also have the ability to post process such mosaics into a convenient viewing surface (see Szeliski column 3, lines 56 – 60)

34. Regarding claim 10, Szeliski discloses 'the reference frame image area and the object frame image area for synthesis are areas derived by dividing each frame image

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in an identical manner' (see abstract; column 20, lines 58 - 63). Szeliski specifically suggests dividing both images into a number of 16x16 patches; and

'the target extracting module extracts a target frame image area at a same location corresponding to the comparison reference frame image area' (see column 4, lines 13 – 18). Szeliski specifically suggests that for each of the pixel locations in the one image, ray directions are determined to the relative 3-dimensional coordinate system of the corresponding pixel location (same location) in each of the other images.

35. As to claim 20, the discussions are addressed with respect to claim 9.

36. As to claim 21, the discussions are addressed with respect to claim 10.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PIERRE DIVERSE whose telephone number is (571)270-3911. The examiner can normally be reached on Monday to Thursday 8:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pierre Diversé/
Examiner, Art Unit 2624

/P. D./
/Brian Q Le/
Primary Examiner, Art Unit 2624